Claims

[c1]   1. A method for detecting and correcting tube spit comprising the steps of:

monitoring the generator output from a CT system generator;

determining whether a tube-spit event occurred; and

if a tube spit occurred, performing tube spit correction.

[c2]   2. The method of claim 1 wherein the step of determining whether a tube spit event has occurred includes the step of monitoring either the generator kV or mA waveforms.

[c3]   3. The method of claim 2 further comprising the step of determining whether a tube spit event occurred comprises determining whether generator output dropped below a threshold value.

[c4]   4. The method of claim 2 further comprising the step of setting a generator output threshold, wherein if the generator output falls below the threshold, a tube spit event is declared.

[c5]   5. The method of claim 4 further comprising the step of determining the number of corrupted views that need to

be corrected.

[c6]   6. The method of claim 5 further comprising the step of providing a warning to the operator if the actual number of corrupted views exceeds the maximum allowable number of corrupted views.

[c7]   7. The method of claim 6 further comprising the step of storing the history and magnitude of tube spit occurrences.

[c8]   8. The method of claim 7 further comprising the step of notifying the operator and/or service personnel of the need to change the x-ray tube.

[c9]   9. The method of claim 8 further comprising the step of using view interpolation between the two most recent good images to replace the corrupted views in between.

[c10]   10. The method of claim 9 further comprising the step of using linear interpolation between the two most recent good images to replace the corrupted views in between.

[c11]   11. The method of claim 9 further comprising the step of using a high-order interpolation between the two most recent good images to replace the corrupted views in between.

[c12]   12. The method of claim 9 wherein the view interpolation

is performed in accordance with:

$$P_{ij}(k+n) = ((n_{view} - n)/(n_{view} + 1))P_{ij}(k-1) + ((n+1)/(n_{view} + 1))P_{ij}(k + n_{view})$$

wherein $P_{ij}(k+n)$ is the projection at channel i, detector row j, view number k+n.

[c13] 13. A processor programmed to

monitor the generator output from a CT system generator;

determine whether a tube-spit event occurred; and

if a tube spit occurred, perform tube spit correction.

[c14] 14. The method of claim 13 wherein the step of determining whether a tube spit event has occurred includes the step of monitoring either the generator kV or mA waveforms.

[c15] 15. The method of claim 14 further comprising the step of determining whether a tube spit event occurred comprises determining whether generator output dropped below a threshold value.

[c16] 16. The method of claim 15 further comprising the step of setting a generator output threshold, wherein if the generator output falls below the threshold, a tube spit event is declared.

[c17]   17. The method of claim 16 further comprising the step of determining the number of corrupted views that need to be corrected.

[c18]   18. The method of claim 17 further comprising the step of providing a warning to the operator if the actual number of corrupted views exceeds the maximum allowable number of corrupted views.

[c19]   19. The method of claim 18 further comprising the step of storing the history and magnitude of tube spit occurrences.

[c20]   20. The method of claim 19 further comprising the step of notifying the operator and/or service personnel of the need to change the x-ray tube.

[c21]   21. The method of claim 20 further comprising the step of using view interpolation between the two most recent good images to replace the corrupted views in between.

[c22]   22. The method of claim 21 further comprising the step of using linear interpolation between the two most recent good images to replace the corrupted views in between.

[c23]   23. The method of claim 21 further comprising the step of using a high-order interpolation between the two

most recent good images to replace the corrupted views in between.

[c24] 24.The method of claim 21 wherein the view interpolation is performed in accordance with:

$$P_{ij}(k+n) = ((n_{view}-n)/(n_{view}+1))P_{ij}(k-1) + ((n+1)/(n_{view}+1))P_{ij}(k+n_{view})$$

wherein $P_{ij}(k+n)$ is the projection at channel i, detector row j, view number k+n.

[c25] 25.A method comprising the steps of:
  providing an x-ray controller for monitoring the output of a CT system generator;
  providing a computer to monitor the generator output from a CT system generator;
  setting a voltage threshold that, if the voltage to the x-ray controller falls below, a tube-spit event is declared;
  determining the number of corrupted views;
  warning the operator if the maximum number of corrupted views has been exceeded; and
  if a tube spit occurred, performing tube spit correction.

[c26] 26.The method of claim 25 further comprising the step of providing a warning to the operator that the maxi-

mum allowable number of corrupted views has been exceeded.

[c27] 27.The method of claim 26 further comprising the step of storing the history and magnitude of tube spit occurrences.

[c28] 28.The method of claim 27 further comprising the step of notifying the operator and/or service personnel of the need to change the x-ray tube.

[c29] 29.The method of claim 28 further comprising the step of using view interpolation between the two most recent good views to replace the corrupted views in between.

[c30] 30.The method of claim 29 further comprising the step of using linear interpolation between the two most recent good images to replace the corrupted views in between.

[c31] 31.The method of claim 29 further comprising the step of using a high-order interpolation between the two most recent good images to replace the corrupted views in between.

[c32] 32.The method of claim 29 wherein the view interpolation is performed in accordance with:

$$P_{ij}(k+n) = ((n_{view} - n)/(n_{view} + 1))P_{ij}(k-1) + ((n+1)/(n_{view} + 1))P_{ij}(k + n_{view})$$

wherein $P_{ij}(k+n)$ is the projection at channel i, detector row j, view number k+n.